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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,892	06/26/2003	Takeharu Okuno	03560.003326	4901

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 07/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,892

Applicant(s)

OKUNO, TAKEHARU

Examiner

Arnel C. Lavarias

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/9/03, 6/26/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/9/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 6/26/03. These drawings are objected to for the following reason(s) as set forth below.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:
Figure 21- Reference numeral 18.

Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. Claims 3-5 are objected to because of the following informalities:

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The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 3, lines 2-4- The specification fails to provide proper antecedent basis for the diffusion coefficient of the material of the first diffraction grating (i.e. the diffraction grating disposed directly on the substrate) being greater than a diffusion coefficient of the material of the second diffraction grating (i.e. the diffraction grating disposed on the first diffraction grating).

Claim 4, lines 3-5- The specification fails to provide proper antecedent basis for the second diffraction grating being any one of the following materials: gold, silver, chromium, zirconium, titanium, copper, tungsten, magnesium, tantalum, platinum, or compounds thereof.

Claim 5, line 2- The specification fails to provide proper antecedent basis for a thin Na_3AlF_6 film being disposed between the substrate and the first diffraction grating. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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5. Claims 1-2, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Francis (U.S. Patent No. 3291871).

Francis discloses an optical element (See for example Figure 6; col. 3, line 13-col. 4, line 69)) comprising a substrate (See 10 in Figure 6); a first diffraction grating disposed on the substrate and having a period that is shorter than a light wavelength used (See 20 in Figure 6); and a second diffraction grating disposed on the first diffraction grating and having a period that is shorter than the light wavelength used (See 25 in Figure 6), wherein the melting point of a material of the first diffraction grating (See col. 3, lines 47-58, wherein the melting point of platinum is approximately 1768.3 deg. C) is higher than the melting point of a material of the second diffraction grating (See col. 3, lines 47-58, wherein the melting points of copper, silver, and gold are 1084.62 deg. C, 961.78 deg. C, and 1064.18 deg. C, respectively). Francis additionally discloses the material of the first diffraction being a metal, and the material of the second diffraction grating being a metal that is different from the material of the first diffraction grating (See col. 3, lines 47-58); the materials of the first and second diffraction gratings being one of gold, silver, copper, and platinum (See col. 3, lines 47-58); and each grating period that is shorter than the light wavelength used falls in a range from at least 30 nm to 200 nm at most (See col. 2, line 64-col. 3, line 5).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Francis in view of Li (U.S. Patent No. 5230924).

Francis discloses the invention as set forth above in Claim 1, except for a diffusion coefficient of the material of the first diffraction grating being greater than a diffusion coefficient of the material of the second diffraction grating. However, Li teaches general methods for bonding metal coatings onto ceramic for high temperature use. In particular, Li discusses generally accepted bonding techniques in the semiconductor industry, where a common method of metallization contacting or bonding diamond to copper consists of sputtering a thin layer of titanium, followed by a layer of platinum and a layer of gold. The titanium metal bonds to the diamond, and the gold bonds to the copper metal. However, the platinum is provided to prevent diffusion of the gold into the platinum. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diffusion coefficient of the material of the first diffraction grating being greater than a diffusion coefficient of the material of the second diffraction grating, as taught by Li, in the optical element of Francis, to prevent intermingling of the various metal layers, which may lead to intermetallic formation, peeling, or unwanted reaction between the metallic layers.

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Francis in view of Perkins et al. (U.S. Patent No. 6288840).

Francis discloses the invention as set forth above in Claim 1, except for a thin film of either MgF_2 or Na_3AlF_6 being disposed between the substrate and the first diffraction grating. However, Perkins et al. teaches a wire grid polarizer for use in the visible spectrum (See for example Figures 6-7), wherein an additional thin film comprising a low refractive index material, such as MgF_2 , is deposited between the substrate and the diffraction grating. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a thin film of either MgF_2 or Na_3AlF_6 be disposed between the substrate and the first diffraction grating, as taught by Perkins et al., in the optical element of Francis, for the purpose of optimizing the performance of the wire grid polarizer by shifting or suppressing unwanted resonances out of the wavelength band of operation.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

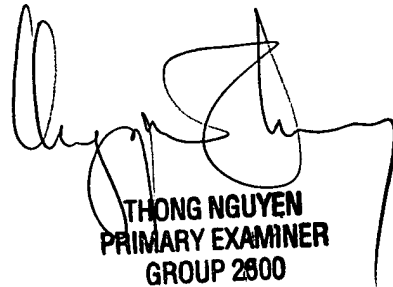
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Arnel C. Lavarias
7/15/04



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